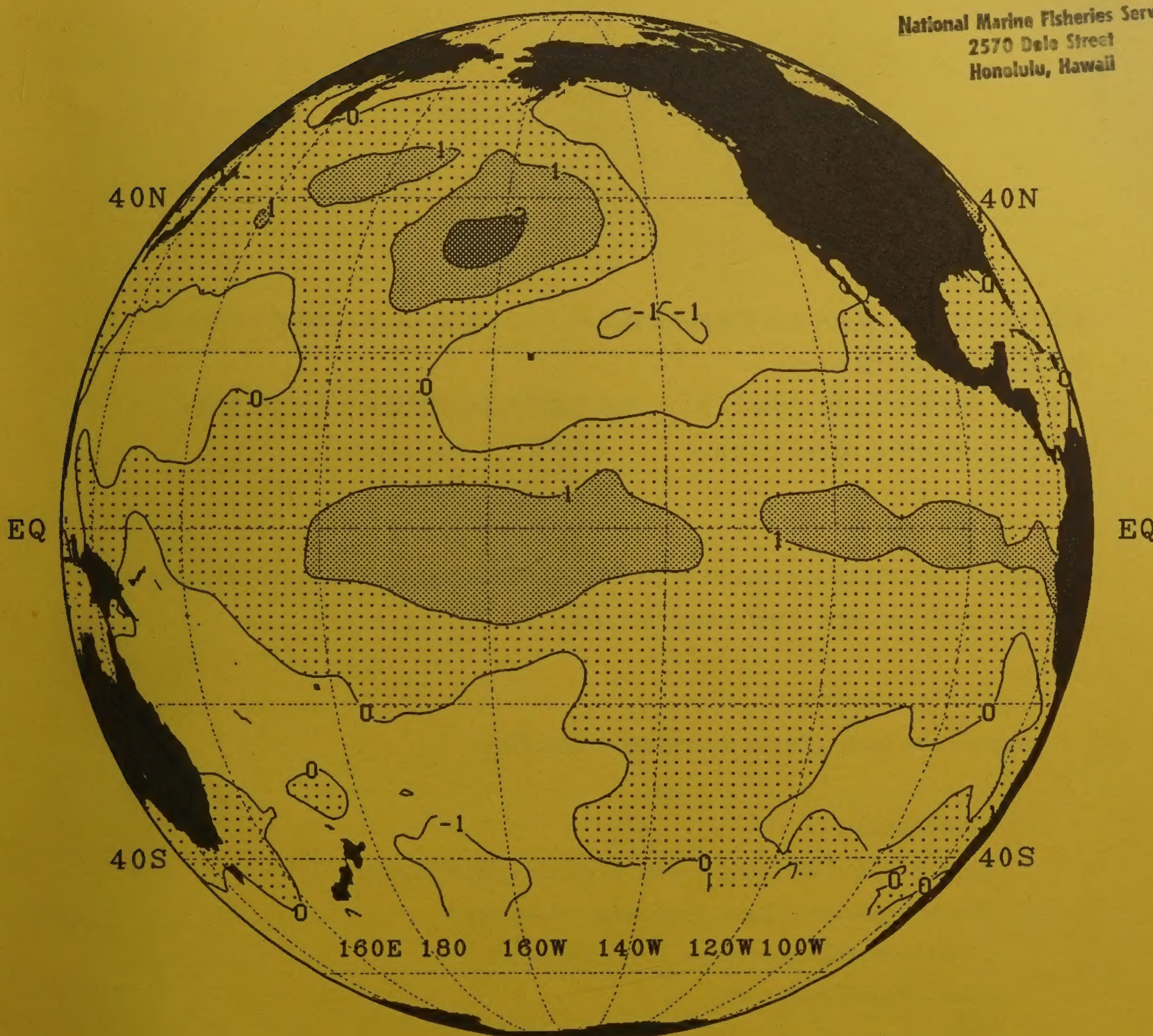
気 象 庁 海 洋 月 報

Monthly Ocean Report

December 1994 (No. 24)



El Niño Monitoring Center
Japan Meteorological Agency

気 象 庁 海 洋 気 象 部 海 洋 課
エ ル ニ ー ニ ョ 監 視 セ ン タ ー

平 成 6 年 1 2 月

気象庁海洋月報は、気象庁海洋気象部海洋課エルニーニョ監視センターで作成されています。
本月報に関する問い合わせは、

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Monthly Ocean Report is prepared by the El Niño Monitoring Center, Oceanographical Division, Marine Department, Japan Meteorological Agency.

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表紙は、1994年12月の太平洋の月平均海面水温偏差図です。
陰影部は、平年より高温の海域を示しています。

The figure on the front cover shows the monthly mean SST anomalies for December 1994 in the Pacific Ocean.
Areas of positive anomalies are shaded.

目　　次

Table of Contents

海況の特徴（１９９４年１２月）

太平洋の海況

太平洋赤道域の海面水温は、日付変更線付近から南米にかけて平年より１℃以上高い海域が広がっていた。また、日付変更線付近の海面水温は、30℃を越えていた。エルニーニョ監視海域（4°S～4°N、150°W～90°W）の海面水温偏差は、+1.1℃だった（第１表、第１図、第６図）。

赤道域表層の28℃以上の暖水層は、155°Eから155°Wにかけて深さ100mに達していた。また、日付変更線から165°Wにかけては、30℃以上の暖水がみられた。（第３図）。

北太平洋では、45°N・170°E付近及び35°N・160°W付近を中心に、平年より１～2℃以上高い状態が続いていた。一方、北米西岸沖は平年より低く、アラスカ湾及び25°N・140°W付近では、平年より１℃以上低かった。また、15～30°Nの135°Eから170°Eにかけて、平年より低い状態が続いていた。（第１図）。

日本近海の海況

日本近海は、日本海西部及び北海道南東方を除き平年より0.5～1℃高かった（第17図）。

黒潮は日本の南岸に沿ってほぼ直進し、房総半島沖を東に流れていた（第20図）。

本州東方の親潮系の冷水（深さ100mで5℃以下）は、39.8°N・145.6°Eまで達していた（第19図）。

熱帯の気象

熱帯の対流活動は、日付変更線付近で平年より非常に活発であった。１１月末から１２月上旬にかけて、インド洋から150°W付近にかけて、対流活動の活発な領域の顕著な東進が見られた。月平均海面気圧偏差は、日付変更線の西で正偏差、東で負偏差の分布が続いており、南方振動指数（ＳＯＩ）は-1.2と大きな負の値となった。（第１表、第12図、第13図）。

[気象庁長期予報課提供]

HIGHLIGHTS December 1994

Pacific

Sea surface temperatures (SSTs) along the equator were more than 1°C above normal between the date line and the South American coast in the Pacific. SSTs were greater than 30°C near the date line. The SST index for region B (Fig. 6) was +1.1°C (Table 1 and Figs. 1 and 6).

The thickness of surface warm water (above 28°C) along the equator was about 100 m between 155°E and 155°W. The warmest equatorial water (above 30°C) was observed between the date line and 165°W (Fig. 3).

In the North Pacific, SSTs were continued to be 1-2°C above normal around 45°N, 170°E and 35°N, 160°W. SSTs were more than 1°C below normal in the Gulf of Alaska and around 25°N, 140°W, and continued to be below normal between 15°N and 30°N from 135°E to 170°E (Fig. 1).

Seas adjacent to Japan

SSTs in the seas adjacent to Japan were 0.5-1°C above normal except in the western part of the Japan Sea and southeast of Hokkaido (Fig. 17).

The Kuroshio flowed straight along the south coast of Japan, then flowed eastward off the Boso Peninsula (Fig. 20).

The Oyashio cold water (below 5°C at a 100 m depth) extended southward to 39.8°N, 145.6°E (Fig. 19).

Atmospheric conditions in the tropics

The convective activity was strongly enhanced near the date line. The prominent eastward migration of convective activity along the equator was observed from the Indian Ocean to 150°W from the end of November to early in December. Sea level pressure anomaly patterns continued with positive anomalies over the western Pacific and negative ones over the eastern Pacific. Consistent with this pattern, the SOI has been large negative value -1.2 (Table 1 and Figs. 1 and 13).

[Prepared by the Long-range Forecast Division, JMA]

List of Errata on Coastal Water Temperature

No. of report /Page No.	地名 (station) (WMO Index No.)	誤 (for)		正 (read)	
		水温 (Temp.)	偏差 (Anom.)	水温 (Temp.)	偏差 (Anom.)
No. 12/P.18	那　覇　(47936)	–	–	22.0	+0.6
-ditto-	館　山　(47672)	–	–	16.3	+0.6
-ditto-	浦　河　(47426)	3.6	-0.7	3.3	-1.0
-ditto-	飛　島　(47587)	–	–	11.6	-0.5
-ditto-	牛　深　(47838)	16.6	–	16.8	–
No.13/P.17	紋　別　(47435)	-0.3	–	–	–
No.13/P.18	江　差　(47428)	5.4	–	4.9	–
No.14/P.17	館　山　(47672)	9.2	+0.7	14.0	+0.5
No.15/P.17	寿　都　(47421)	4.4	–	4.5	–
-ditto-	輪　島　(47600)	7.5	-0.9	7.8	-0.6
-ditto-	牛　深　(47838)	15.0	–	15.1	–
No.16/P.18	牛　深　(47838)	18.0	–	18.1	–
No.19/P.16	潮　岬　(47778)	26.0	–	26.1	–
No.20/P.17	寿　都　(47421)	–	–	23.9	–
No.20/P.18	御前崎　(47655)	27.8	+1.8	27.5	+1.5
No.21/P.16	寿　都　(47421)	24.0	–	23.9	–
No.23/P.18	江　差　(47428)	12.5	–	11.4	–
-ditto-	西　郷　(47740)	18.4	–	17.6	–

表　A　「気象庁海洋月報」旬平均沿岸水温の正誤表 (Nos.12～23)

Table A　List of errata on coastal water temperature in previous issues of Monthly Ocean Report (Nos. 12-23)

Date		1993						1994											
		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pacific Sea Surface Temperature (℃)																			
D	(14N～ Eq.)	29.1	28.9	29.1	29.1	29.5	29.1	28.4	28.5	28.6	29.1	29.4	29.6	29.2	29.3	29.1	29.3	29.3	28.8
	(130E～150E)	-0.1	-0.2	-0.1	-0.2	+0.3	+0.2	-0.1	+0.2	+0.2	+0.3	+0.3	+0.3	0.0	+0.2	-0.1	0.0	+0.1	-0.1
A	(4N～ 4S)	29.1	28.8	29.1	28.8	28.9	28.7	28.2	28.0	28.2	28.4	28.9	29.0	29.2	29.4	29.1	29.2	29.5	29.4
	(160E～150W)	+0.6	+0.4	+0.8	+0.4	+0.5	+0.5	+0.2	0.0	+0.1	+0.2	+0.4	+0.5	+0.7	+1.0	+0.8	+0.8	+1.1	+1.2
B	(4N～ 4S)	25.8	24.9	24.8	25.0	25.2	25.3	25.7	26.1	26.9	27.0	26.8	26.3	25.1	24.6	24.6	25.3	25.6	26.0
	(150W～ 90W)	+0.6	+0.3	+0.2	+0.4	+0.6	+0.4	+0.3	-0.1	0.0	-0.1	+0.2	+0.2	-0.1	0.0	0.0	+0.7	+1.0	+1.1
C	(Eq.～ 10S)	22.1	21.0	20.8	21.3	21.5	22.8	24.7	26.0	25.3	24.2	23.4	22.2	21.2	20.6	19.9	21.6	22.4	23.6
	(90W～ 80W)	+0.5	+0.4	+0.5	+0.6	0.0	+0.2	+0.4	+0.3	-0.6	-0.9	-0.5	-0.5	-0.4	0.0	-0.4	+0.9	+0.9	+1.0
Pacific Sea Level Anomaly (cm)																			
YAP	(10N, 138E)	1	-1	5	8	8	10	7	7	6	2	2	7	9	1	-5	0	-14	
RABAUL	(4S, 152E)	-8	-9	-7	-6	-5	-2	-1	3	4	5	3	1	2	0	-	-	2	
MAJURO	(7N, 171E)	5	3	1	5	2	3	2	2	3	5	1	-2	-1	0	0	-1	-3	
TARAWA	(1N, 173E)	4	7	4	6	2	1	6	-1	6	6	7	6	9	-	14	10	-	
CHRISTMAS	(2N, 157W)	-2	-1	-1	-2	-1	-7	-3	-7	0	0	1	1	4	7	4	9	7	
SANTA CRUZ	(1S, 90W)	0	0	1	3	0	0	-1	0	-4	-8	-3	1	0	-1	1	4	10	

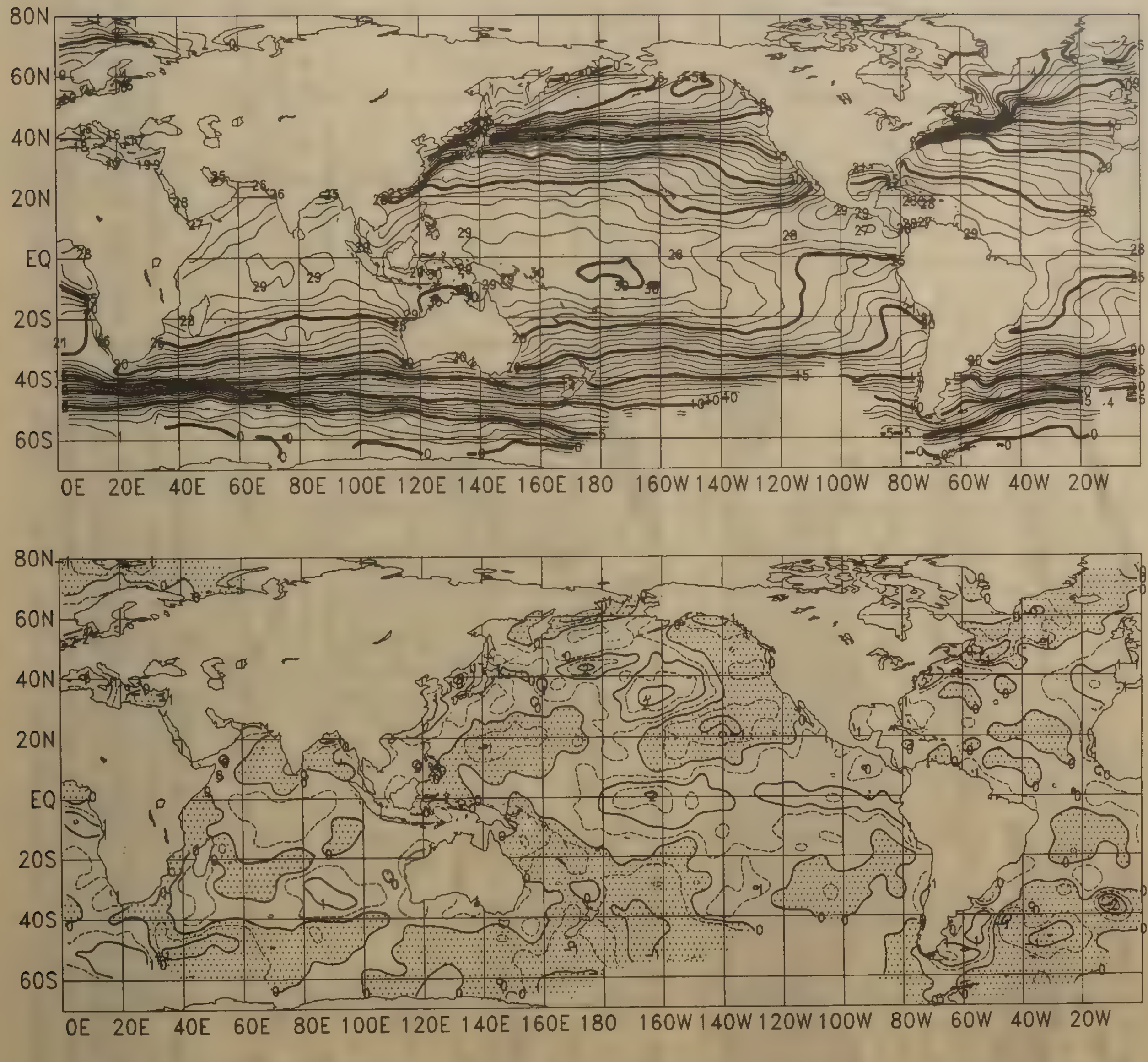
第１表（a）エルニーニョ監視指数

Table 1(a) El Niño monitoring indices. Data sources are the El Niño Monitoring Center, JMA for the sea surface temperature and the SOC of ISLP-PAC, Department of Oceanography, University of Hawaii for the sea level anomaly.

Date		1993						1994											
		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Southern Oscillation Index																			
SOI	(TAHITI-DARWIN)	-1.0	-1.5	-0.7	-1.4	-0.0	0.2	-0.2	0.1	-0.8	-2.1	-1.4	-1.0	-1.6	-1.8	-1.6	-1.5	-0.6	-1.2
TAHITI	(17.5S, 150W)	-1.1	0.0	-0.0	-0.9	0.1	-0.0	-0.1	0.0	-0.1	-1.5	-0.8	-0.9	-1.5	-0.7	-1.5	-1.1	-0.2	-0.3
DARWIN	(12.5S, 131E)	0.4	2.2	1.4	1.3	0.1	-0.5	0.3	-0.2	1.7	1.2	1.0	0.3	1.0	2.0	1.5	1.2	0.9	1.8
High Cloud Amount Index																			
HCLD-PH	(20N ~ 10N) (110E ~ 140E)	-0.5	-0.4	0.7	-0.1	-0.6	1.2	-0.5	-0.5	0.6	0.7	0.2	-0.3	3.5	-0.9	0.2	-0.6	-3.4	-0.7
HCLD-MC	(5N ~ 5S) (110E ~ 135E)	-1.0	-1.4	-1.0	-1.5	-0.8	-0.2	-0.4	-0.5	0.8	0.4	0.4	-1.0	-1.1	-1.1	-1.1	-1.9	-1.3	-0.2
HCLD-DL	(5N ~ 5S) (170E ~ 170W)	1.3	0.3	1.8	1.7	-0.2	0.0	0.0	-0.7	-0.6	0.4	-0.3	-0.3	-0.5	0.4	1.4	0.2	1.9	2.6
Equatorial Zonal Wind Index																			
U200-IN	(5N ~ 5S) (80E ~ 100E)	-0.3	-0.5	-2.1	-0.7	-0.8	-1.8	-0.4	-0.8	-1.5	-0.2	-0.3	-0.5	-1.2	-0.6	-0.9	1.1	0.5	0.5
U200-CP	(5N ~ 5S) (180 ~ 125W)	1.1	0.3	-0.3	0.0	-0.5	0.4	0.4	0.8	0.2	-0.3	-0.5	-0.7	0.4	0.0	0.1	-0.9	-0.3	0.1
U850-WP	(5N ~ 5S) (160E ~ 175W)	0.1	0.7	-0.0	0.9	-0.4	-0.7	-1.2	-1.0	-0.6	-0.5	-0.3	-0.4	0.1	0.6	0.4	0.9	1.2	1.2
U850-CP	(5N ~ 5S) (170W ~ 135W)	-0.8	0.1	0.2	0.4	0.3	-0.5	-0.6	-0.9	-0.2	-0.4	0.2	-0.6	-0.1	0.0	0.3	1.2	1.2	-0.2
U850-EP	(5N ~ 5S) (130W ~ 100W)	-0.4	0.8	1.0	0.2	0.9	0.2	0.1	-0.4	0.1	-0.5	0.0	-0.5	-1.3	-1.8	0.9	0.8	1.6	0.1

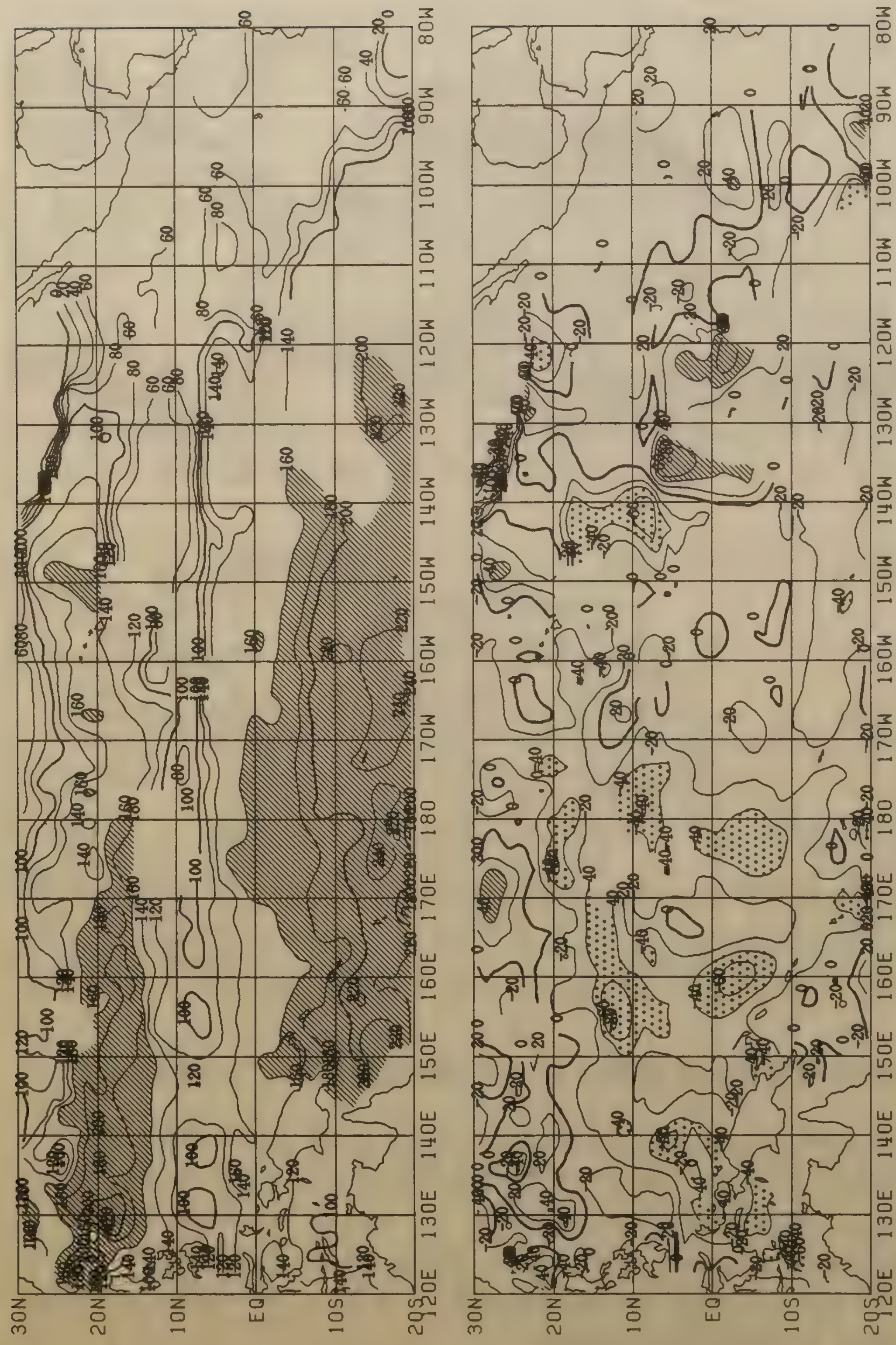
第１表（b）エルニーニョ監視指数(続き)

Table 1(b) El Niño monitoring indices (continued).
Data source for these atmospheric conditions is the Long-range Forecast Division, JMA.



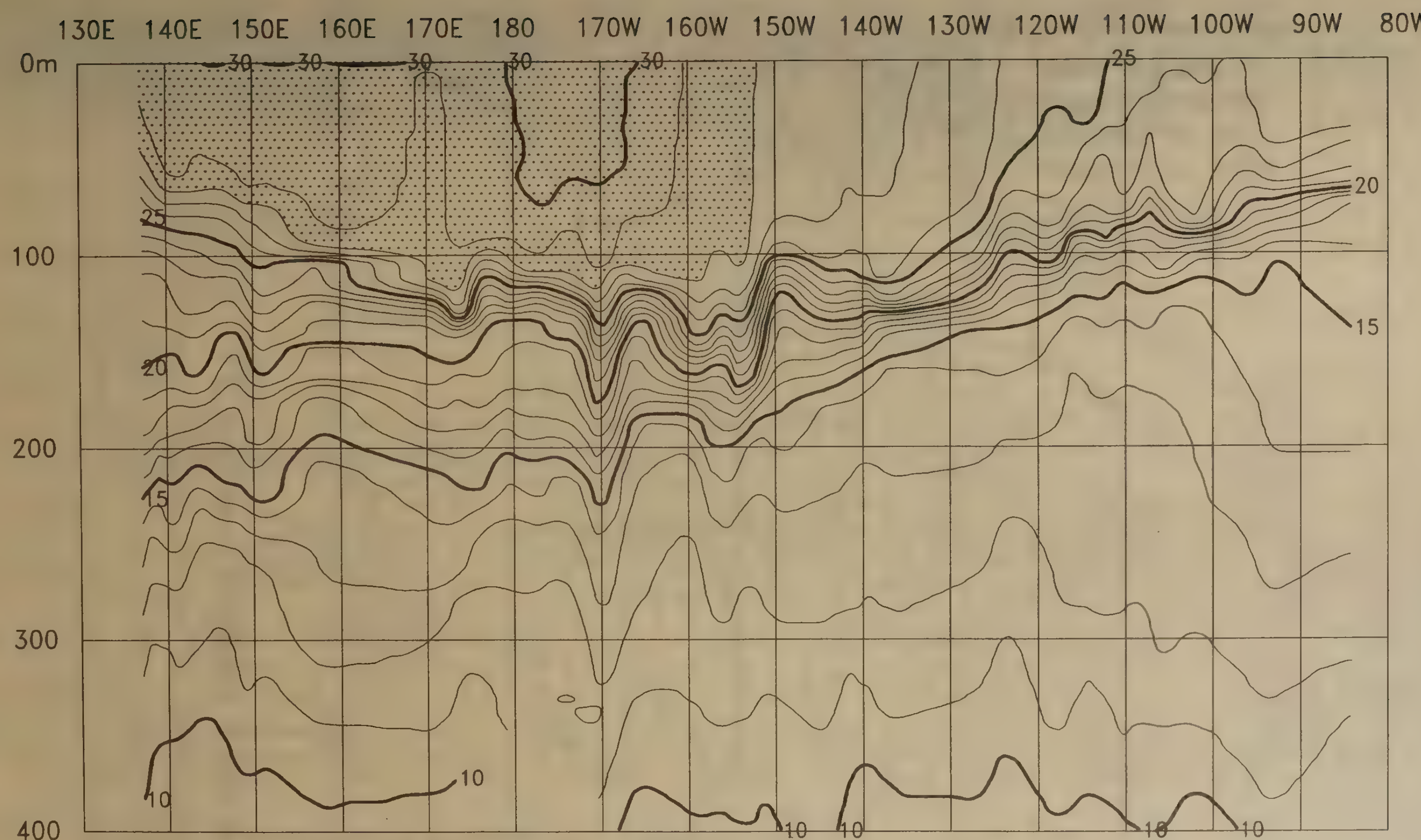
第1図　全球月平均海面水温図（上）及び偏差図（下）（1994年12月）

Fig.1　Monthly mean sea surface temperature in the global ocean (top) and anomalies (bottom) for DEC 1994.　Anomalies are computed with respect to the JMA climatology (1961–90) (Climatic charts of sea surface temperatures of the western North Pacific and the global ocean, March 1991).　The Contour interval is 1°C and additional anomaly contours of ±0.5°C are shown as broken lines.　Negative anomalies are stippled.



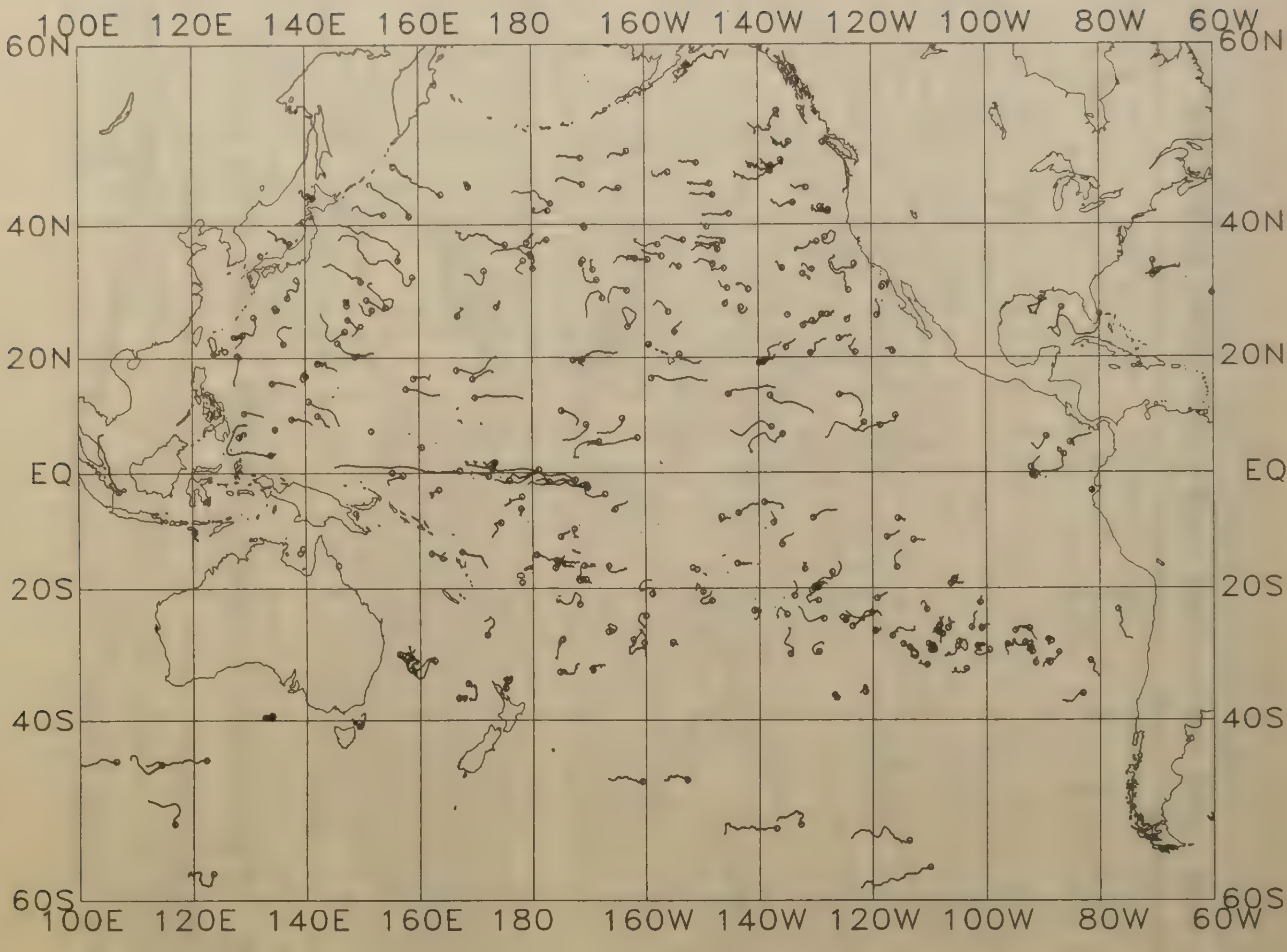
第2図　太平洋表層水温（20℃深度）図（上）及び偏差図（下）（1994年12月）

Fig.2 The depth of a 20° C isotherm in the Pacific Ocean (top) and anomalies (bottom) for DEC 1994. Anomalies are computed with respect to the climatology (Levitus, 1982, Climatological Atlas of the World Ocean, NOAA). The contour interval is 20m with shading for values greater than 160m (top), and shading/stippling for values greater/smaller than +40m/−40m (bottom).



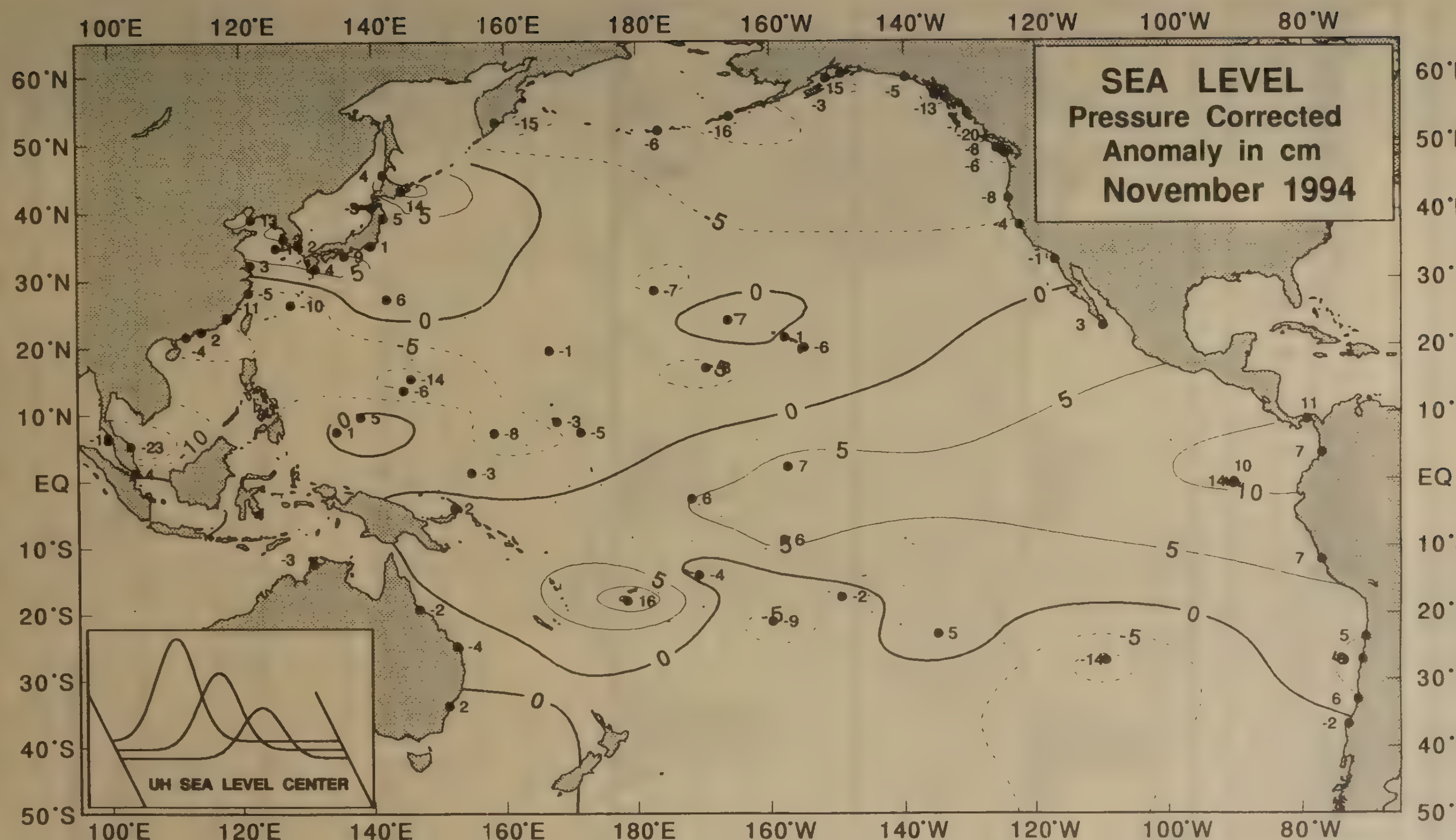
第３図　太平洋赤道に沿う表層水温断面図（1994年12月）

Fig.3 Depth−longitude section of the Pacific Ocean temperature along the equator for DEC 1994. The contour interval is 1°C with spotted shading for values greater than 28°C.



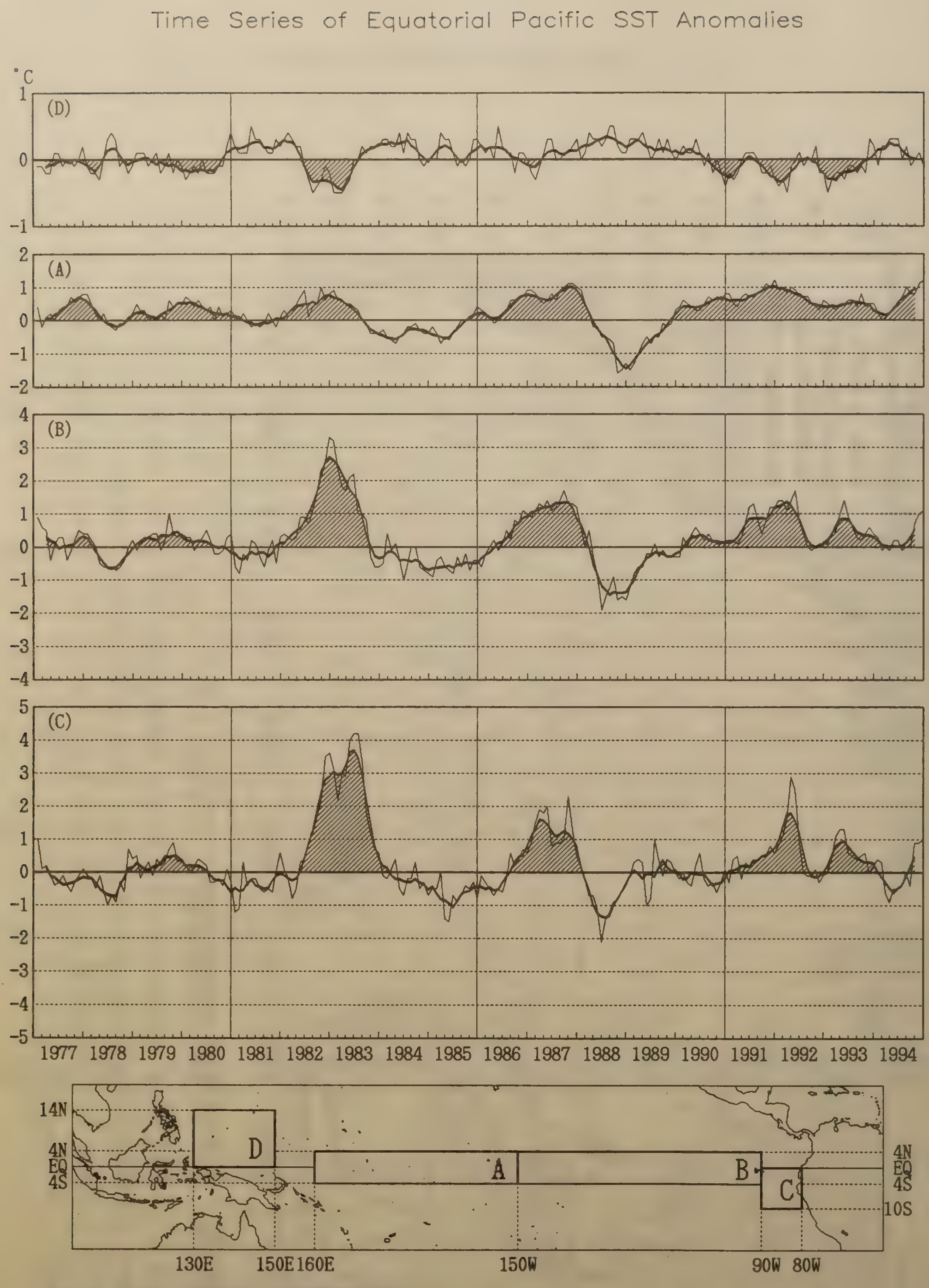
第4図　太平洋ブイ流跡図(1994年12月)

Fig.4　Movements of drifting buoys in the Pacific Ocean during DEC 1994. Each track is one buoy, with the small circle representing the buoy's last position for the month.



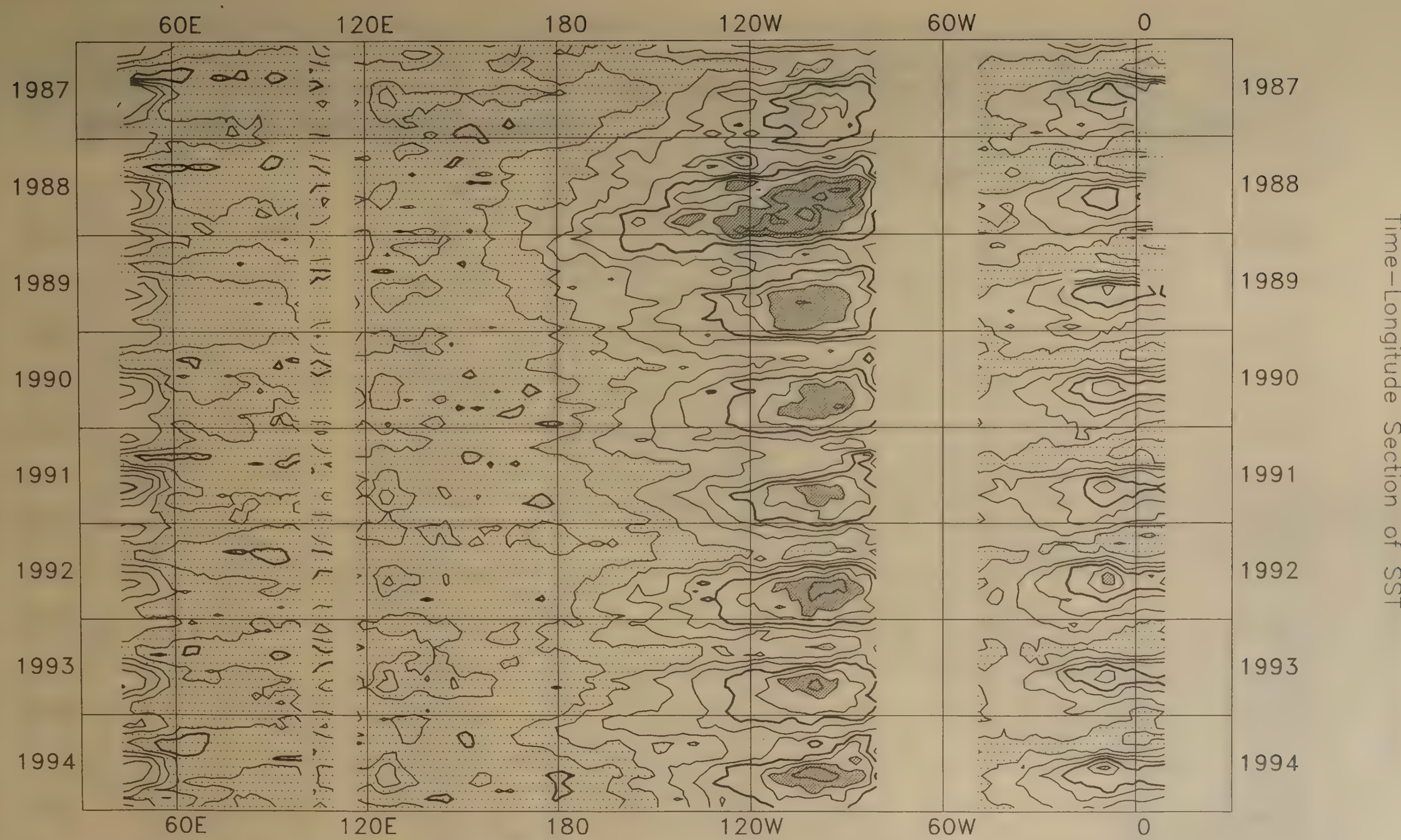
第5図　太平洋海面水位偏差図（ 1994年11月 ）

Fig.5 Sea level anomalies obtained from the 1975 to 1986 mean NOV sea level adjusted for atmospheric pressure (NOV 1994).
This figure is prepared by the SOC of ISLP–PAC, Dept. of Oceanography, Univ. of Hawaii.



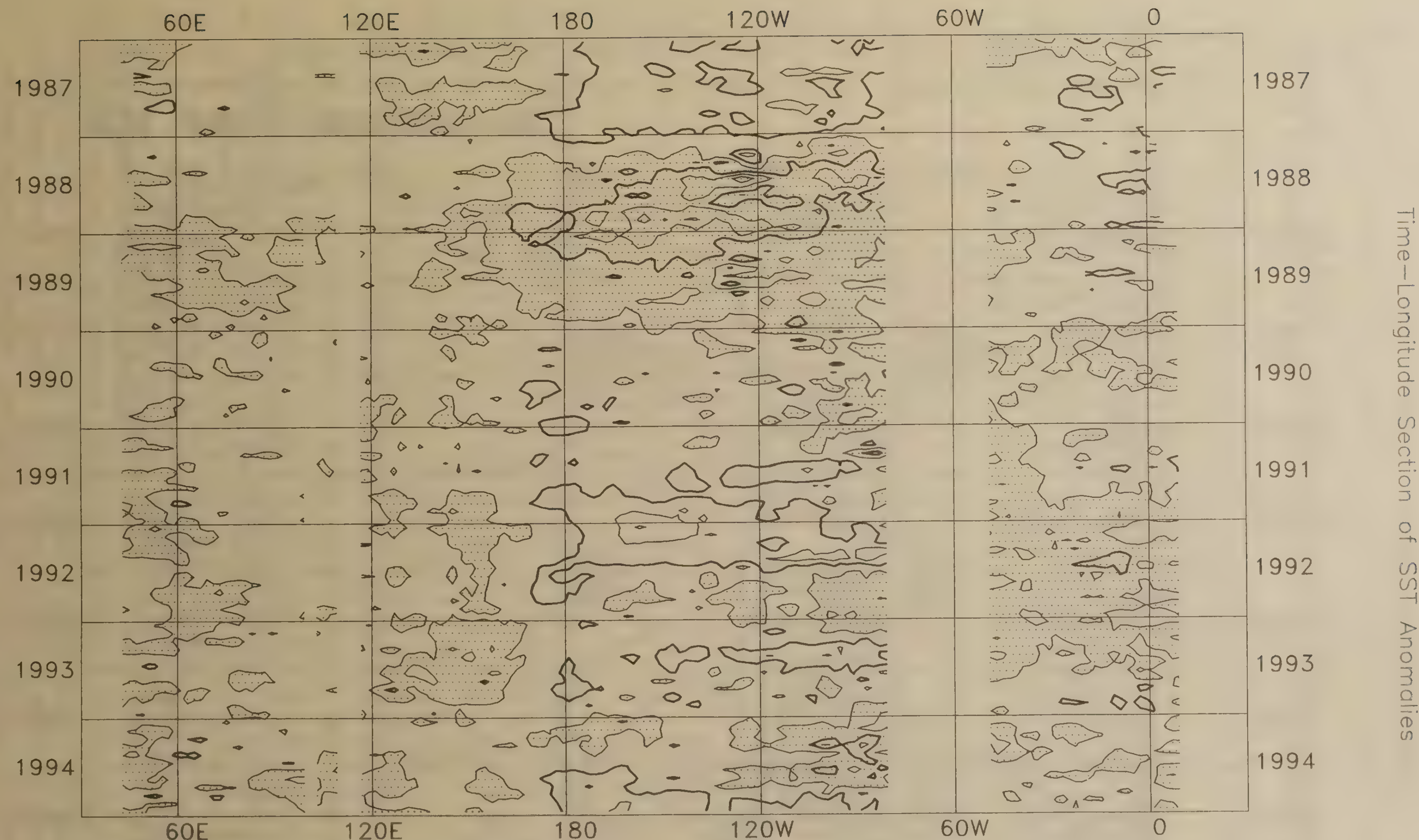
第６図　赤道太平洋海面水温偏差時系列図

Fig.6 Time series of monthly mean SST anomalies in the equatorial Pacific Ocean for the areas indicated at the bottom of the figure. Thin lines show the monthly values and thick lines their 5 month running mean. Positve anomalies (A,B,C) and negative anomalies (D) are shaded. Anomalies are computed with respect to the JMA climatology (1961−90).



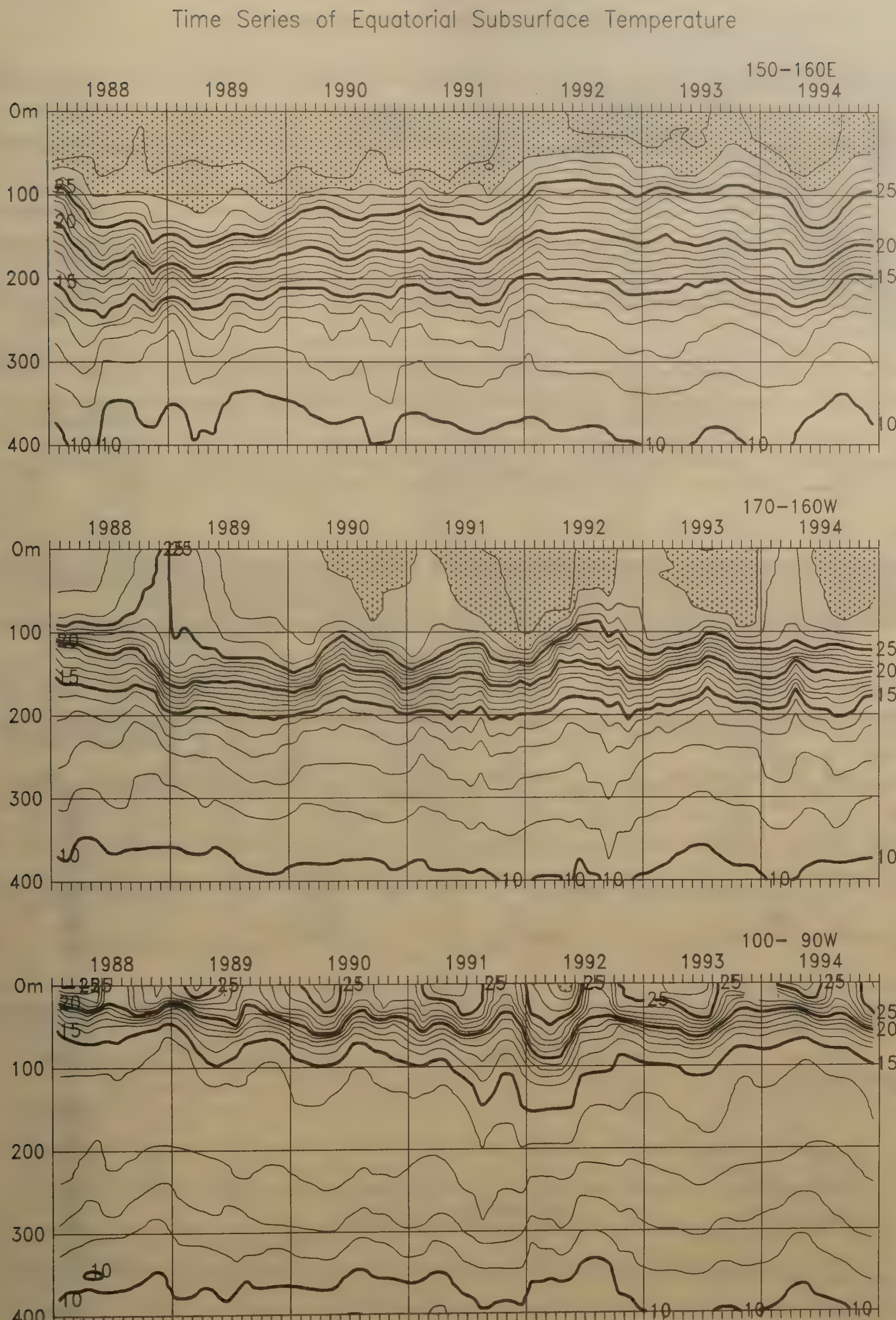
第7図　赤道に沿う海面水温時系列図

Fig.7 Time-longitude section of SSTs along the equator (2° N-2° S) in the global ocean. The contour interval is 1° C, with thick contour lines at 25 and 30° C. SST values greater than 28° C are spotted and values less than 23° C are shaded.



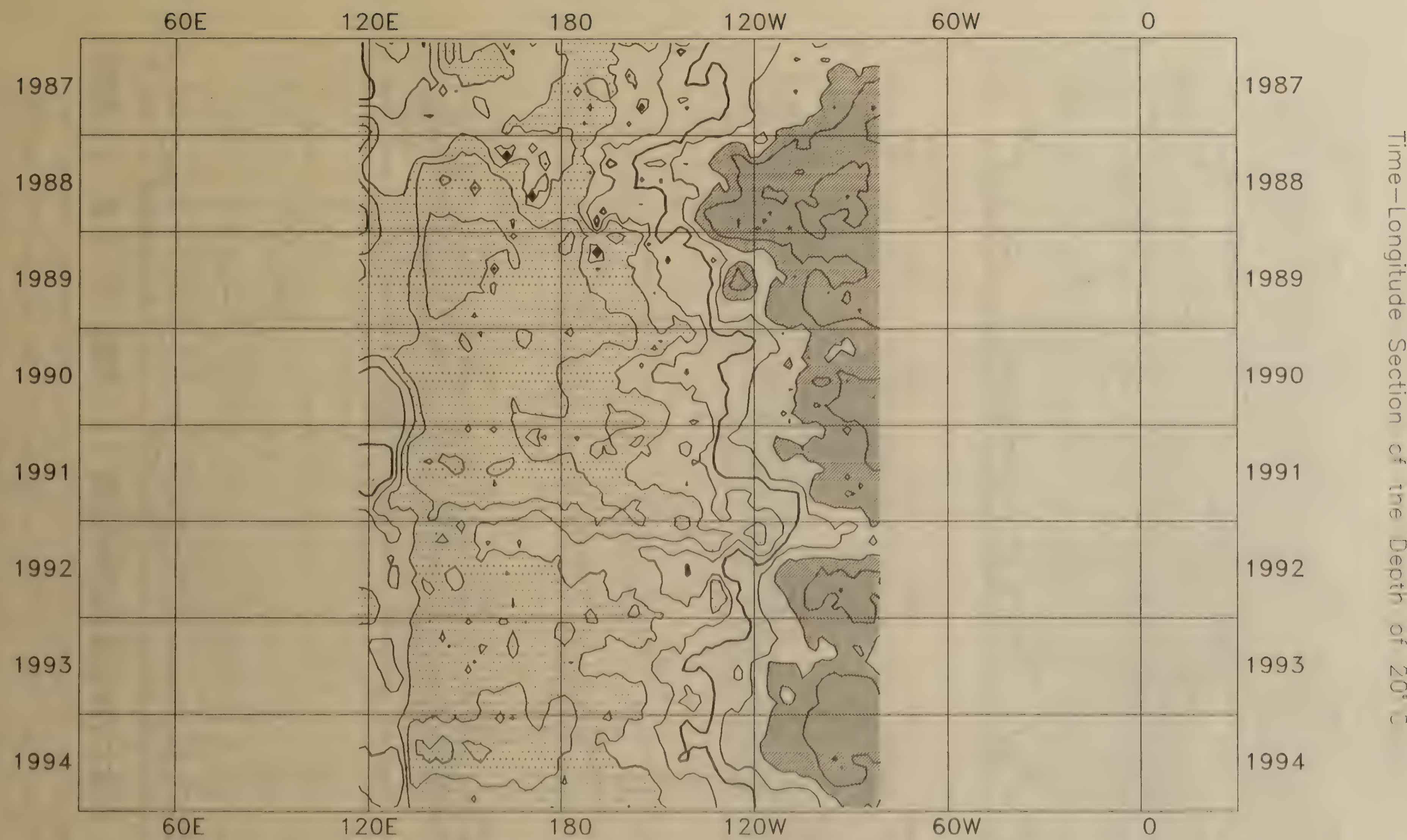
第8図　赤道に沿う海面水温偏差時系列図

Fig.8 Time-longitude section of SST anomalies along the equator (2° N-2° S) based on the JMA climatology (1961-1990). The contour interval is 1° C, with thick contour lines at +1° C and -1° C. Negative anomalies are spotted.



第9図　赤道太平洋表層水温時系列図（上：西部、中：中部、下：東部）

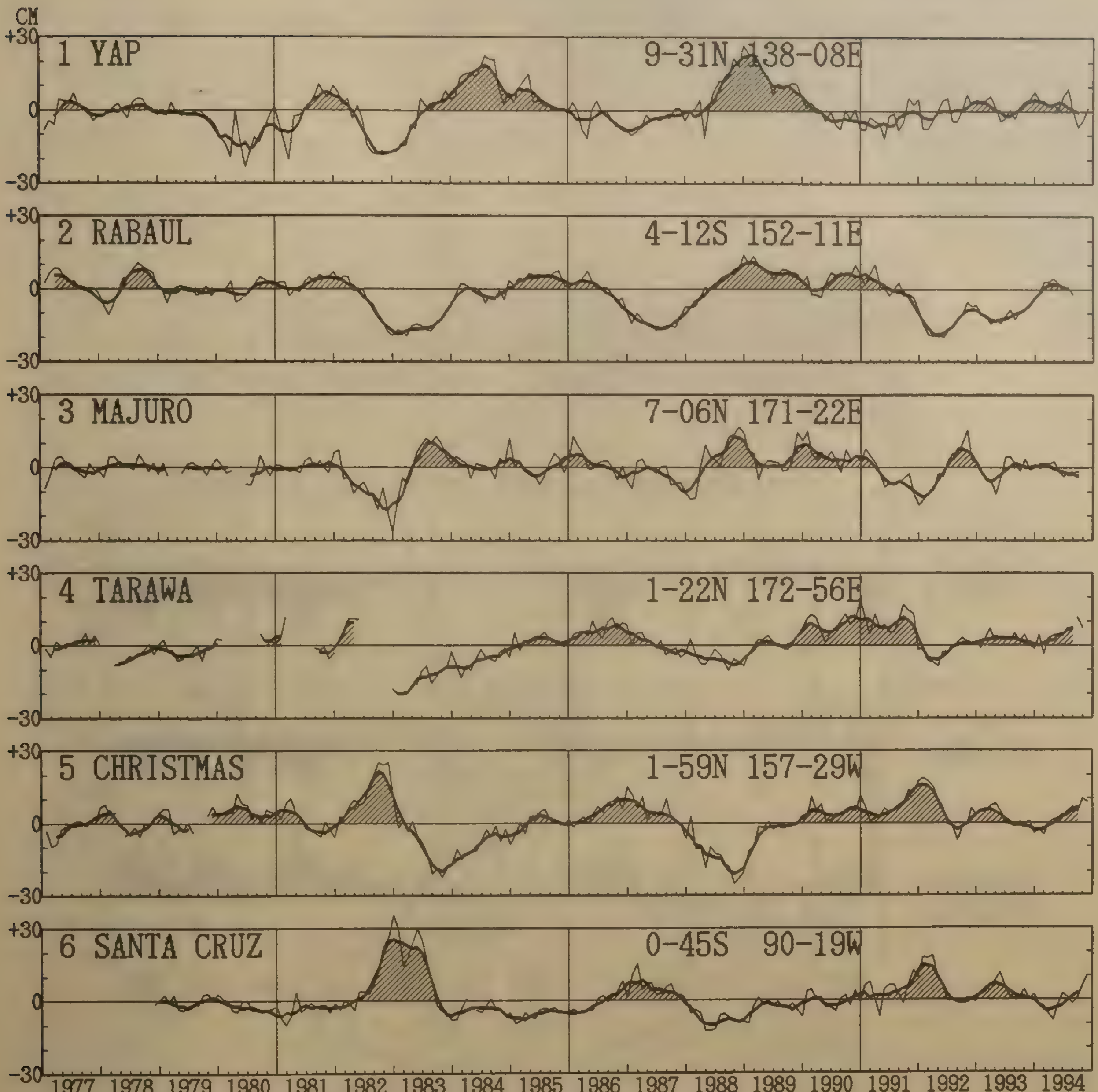
Fig.9 Time series of equatorial (2° N–2° S) subsurface temperature for the western Pacific (top, 150–160° E), the central Pacific (middle, 170–160° W) and the eastern Pacific (bottom, 100–90° W). The contour interval is 1° C with spotted shading for the values greater than 28° C.

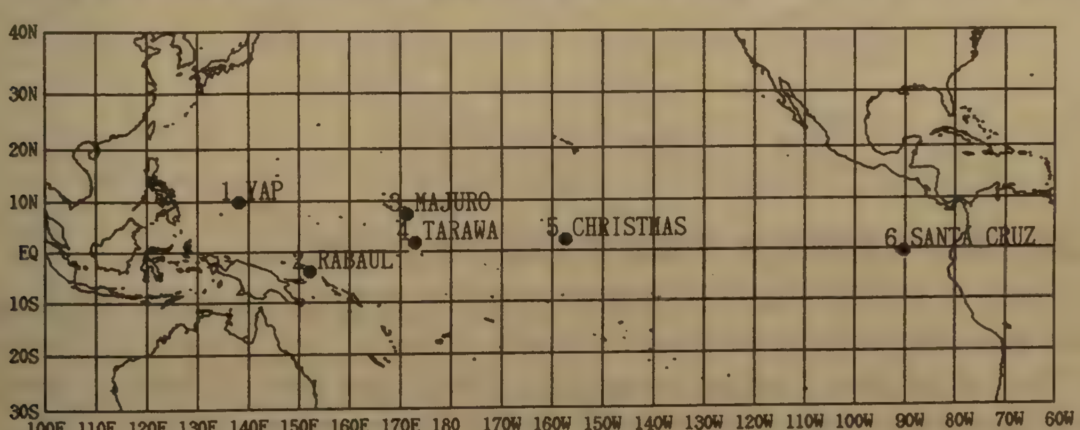


第10図　太平洋の赤道に沿う20℃深度時系列図

Fig.10 Time-longitude section of the depth of a 20°C isotherm along the equator in the Pacific Ocean. The contour interval is 20m with thick contour lines at 100m. Values shallower than 60m are shaded and those deeper than 140m are stippled.

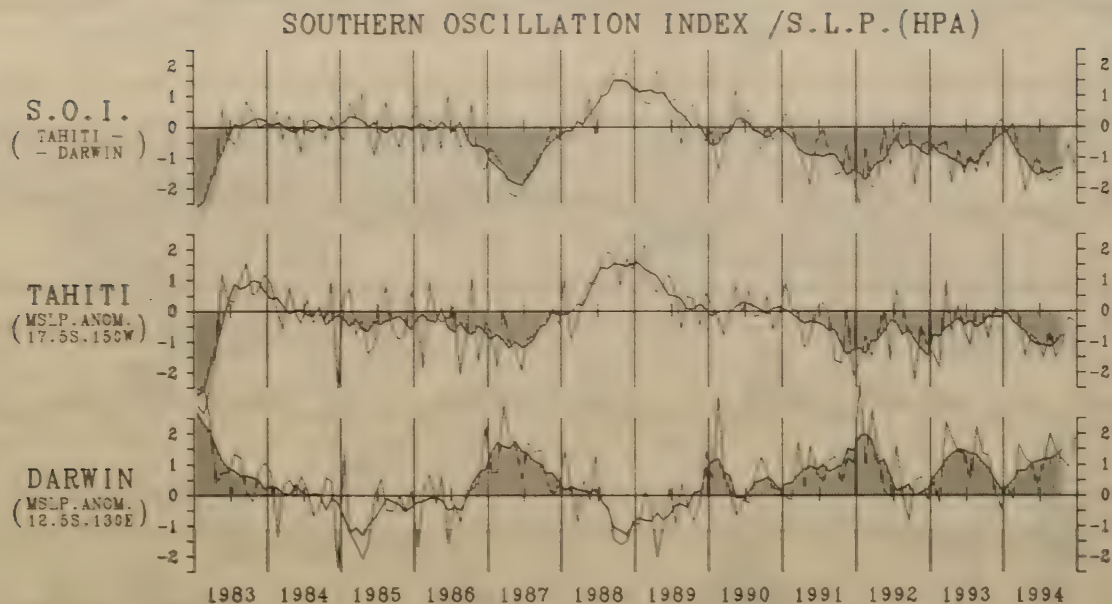
Time series of Sea Level Anomalies





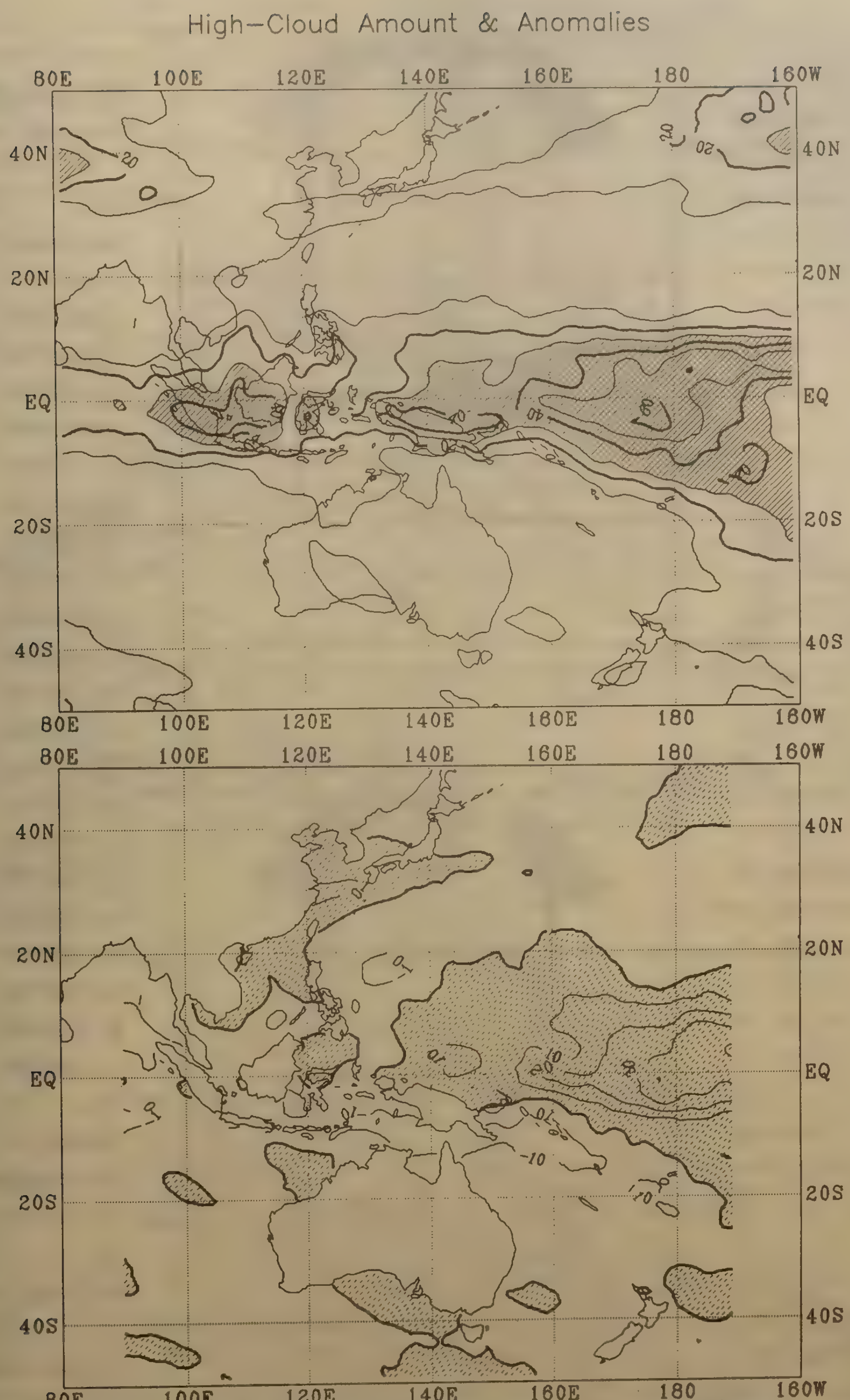
第11図 太平洋月平均海面水位偏差時系列図

Fig.11 Time series of sea level anomalies based on 1976 to 1990 monthly mean sea level obtained from the stations indicated at the bottom of the figure. Thin lines show the monthly mean and thick lines show their 5 month running mean. Positive anomalies are shaded.



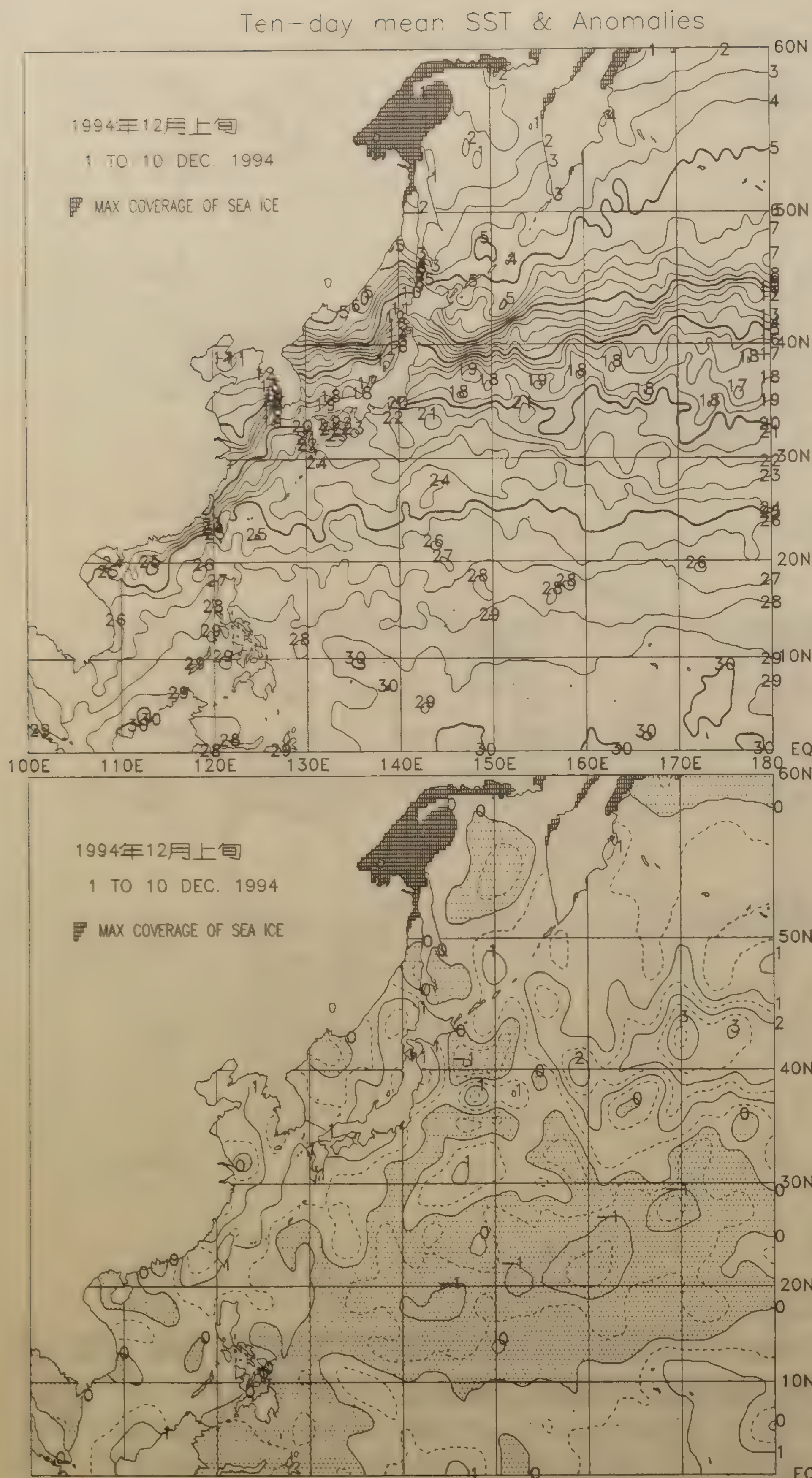
第12図　南方振動指数及び海面気圧偏差時系列図

Fig.12 The Southern Oscillation Index (top) and monthly mean sea level pressure standardized anomalies at Tahiti (middle) and Darwin (bottom). Thin lines show the monthly mean and thick lines their 5 month running mean. Negative values (top, middle) and positive values (bottom) are shaded. Base periods for normals and standard deviations are 1961−1990. This figure is prepared by the Long−range Forecast Division, JMA.



第13図　月平均上層雲量分布図及び偏差図（1994年12月）

Fig.13 Monthly mean of the high-cloud amount (%, top) and its anomalies (%, bottom) in the equatorial Pacific for DEC 1994. The contour interval is 10%. Areas above 30% are shaded (top) and positive anomalies are stippled (bottom). Anomalies represent a departure from the 1978–1990 base period monthly means. This figure is prepared by the Long-range Forecast Division, JMA.



旬平均沿岸水温(℃)
Coastal Water Temperature

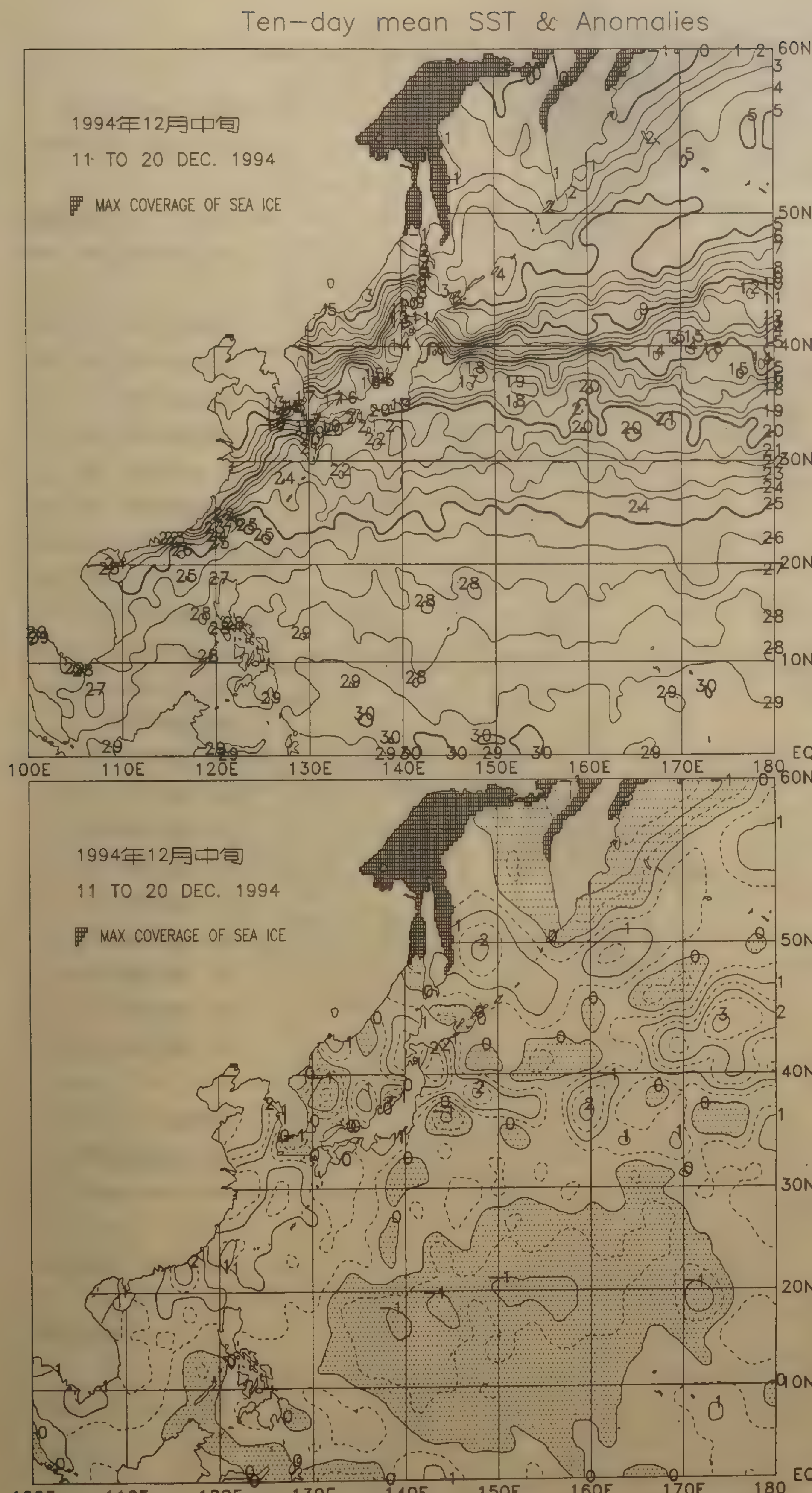
地名 (Index Number)	水温 Temp.	偏差 Anom.
石垣島(47918)	24.8	+2.4
那　覇(47936)	24.0	+1.5
名　瀬(47909)	-	-
足摺岬(47898)	20.4	+1.5
潮　岬(47778)	21.3	-
御前崎(47655)	16.7	+2.4
八丈島(47678)	20.3	+0.3
館　山(47672)	17.5	+0.4
小名浜(47598)	15.1	+1.3
宮　古(47585)	14.0	+1.2
浦　河(47426)	8.3	+1.6
紋　別(47435)	4.4	-
稚　内(47401)	6.3	-
寿　都(47421)	10.6	-
江　差(47428)	9.0	-
飛　島(47587)	15.4	+1.5
輪　島(47600)	14.9	+1.5
西　郷(47740)	16.4	-
浜　田(47755)	18.0	-
厳　原(47800)	18.8	-
牛　深(47838)	20.1	-

海洋気象ブイロボット
旬平均海面水温(℃)
Ocean Data Buoy SST

地点	位置	水温
日本海	37.9N,134.5E	15.7
四国沖	29.0N,135.0E	23.5
東シナ海	28.2N,126.3E	24.3

第14図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(1994年12月上旬)

Fig.14 Ten-day mean SSTs in the western North Pacific (top) and anomalies (bottom) for the 1st ten-day period in DEC 1994. Anomalies are computed with respect to the JMA climatology (1961–90). The contour interval is 1° C and additional anomaly contours of 0.5° C are shown. Negative anomalies are stippled.



旬平均沿岸水温(℃)
Coastal Water Temperature

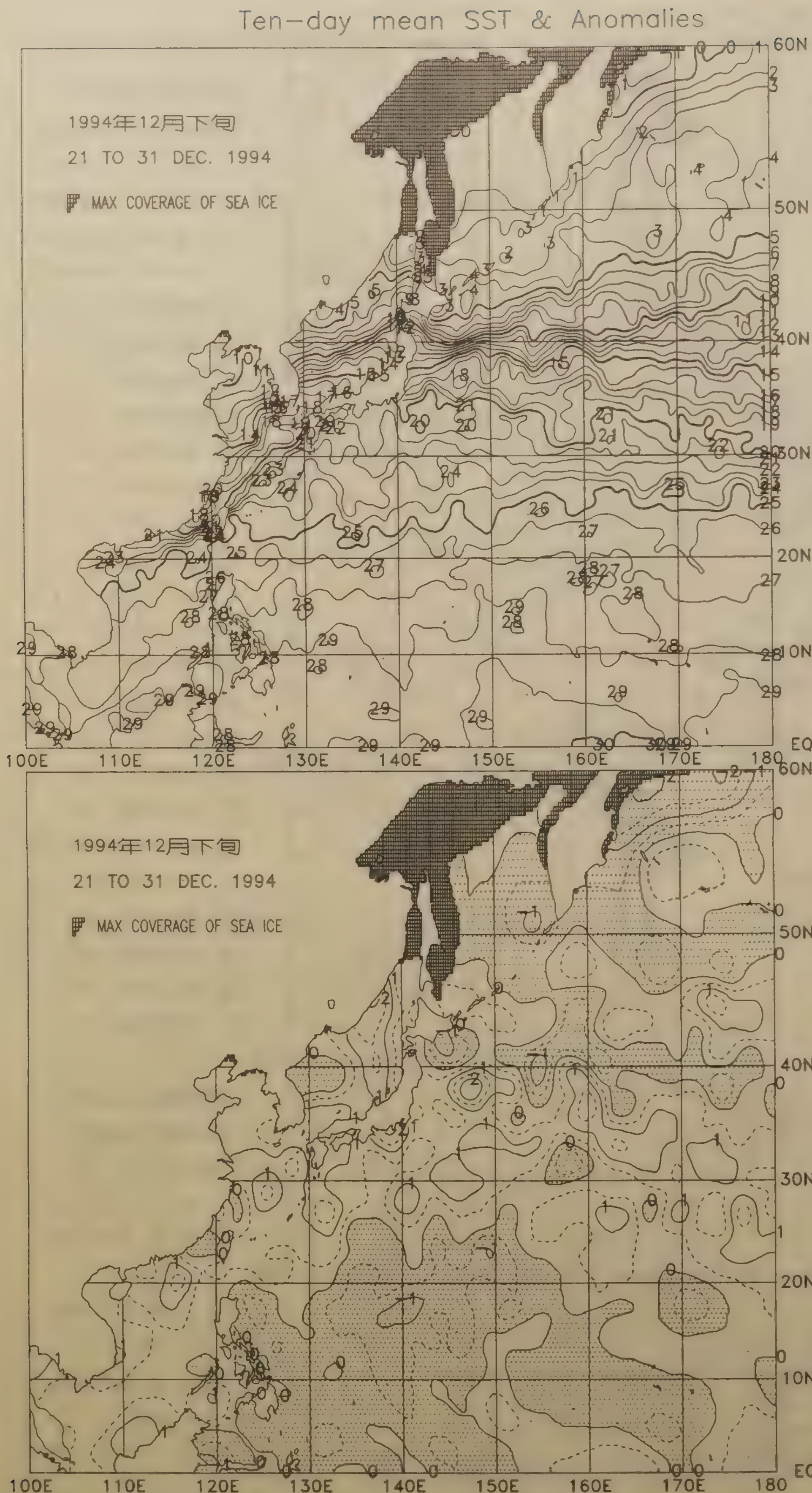
地 名 (Index Number)	水温 Temp.	偏差 Anom.
石垣島(47918)	24.6	+2.8
那　覇(47936)	23.6	+1.5
名　瀬(47909)	-	-
足摺岬(47898)	19.6	+1.5
潮　岬(47778)	19.8	-
御前崎(47655)	15.1	+1.6
八丈島(47678)	19.5	+0.1
館　山(47672)	16.1	-0.1
小名浜(47598)	14.3	+1.2
宮　古(47585)	12.6	+0.9
浦　河(47426)	5.7	-0.1
紋　別(47435)	-	-
稚　内(47401)	4.2	-
寿　都(47421)	8.8	-
江　差(47428)	6.1	-
飛　島(47587)	13.5	+0.6
輪　島(47600)	13.7	+1.5
西　郷(47740)	15.3	-
浜　田(47755)	15.4	-
厳　原(47800)	17.7	-
牛　深(47838)	19.2	-

海洋気象ブイロボット
旬平均海面水温(℃)
Ocean Data Buoy SST

日本海	37.9N,134.5E	16.1
四国沖	29.0N,135.0E	23.4
東シナ海	28.2N,126.3E	23.9

第15図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(1994年12月中旬)

Fig.15 Ten-day mean SSTs in the western North Pacific (top) and anomalies (bottom) for the 2nd ten-day period in DEC 1994. Anomalies are computed with respect to the JMA climatology (1961–90). The contour interval is 1°C and additional anomaly contours of 0.5°C are shown. Negative anomalies are stippled.



旬平均沿岸水温(℃)
Coastal Water Temperature

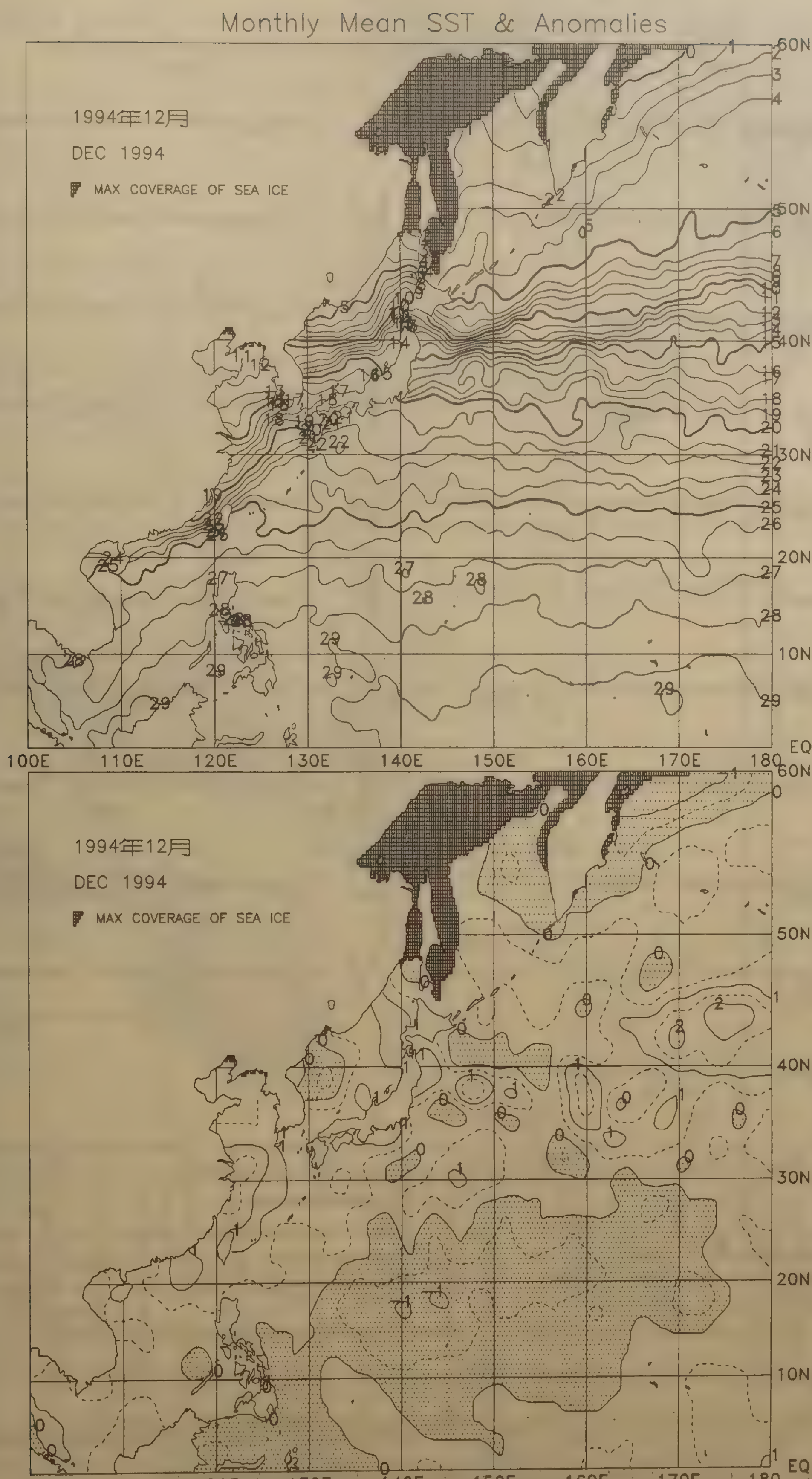
地 名 (Index Number)	水温 Temp.	偏差 Anom.
石垣島 (47918)	23.8	+2.3
那　覇 (47936)	23.0	+1.6
名　瀬 (47909)	-	-
足摺岬 (47898)	19.4	+1.9
潮　岬 (47778)	20.7	-
御前崎 (47655)	16.1	+3.7
八丈島 (47678)	19.5	+0.9
館　山 (47672)	18.0	+2.3
小名浜 (47598)	13.1	+1.0
宮　古 (47585)	11.5	+0.8
浦　河 (47426)	5.0	+0.7
紋　別 (47435)	-	-
稚　内 (47401)	-	-
寿　都 (47421)	7.8	-
江　差 (47428)	7.4	-
飛　島 (47587)	10.7	-1.4
輪　島 (47600)	12.1	+0.9
西　郷 (47740)	14.3	-
浜　田 (47755)	15.3	-
厳　原 (47800)	17.2	-
牛　深 (47838)	18.5	-

海洋気象ブイロボット
旬平均海面水温(℃)
Ocean Data Buoy SST

日本海	37.9N,134.5E	14.0
四国沖	29.0N,135.0E	22.2
東シナ海	28.2N,126.3E	-

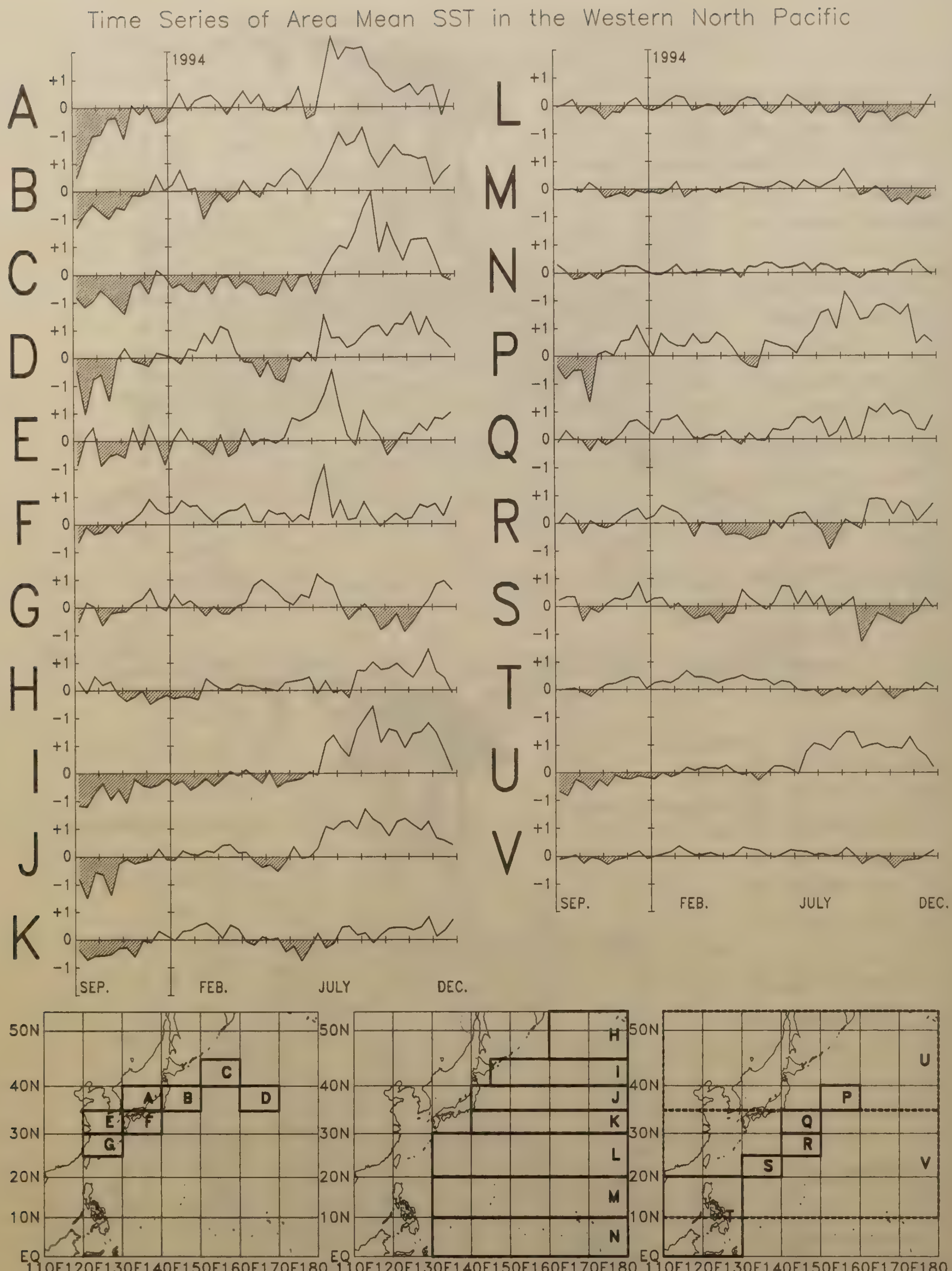
第16図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(1994年12月下旬)

Fig.16 Ten-day mean SSTs in the western North Pacific (top) and anomalies (bottom) for the 3rd ten-day period in DEC 1994. Anomalies are computed with respect to the JMA climatology (1961–90). The contour interval is 1° C and additional anomaly contours of 0.5° C are shown. Negative anomalies are stippled.



第17図 北西太平洋月平均海面水温図(上)及び偏差図(下)(1994年12月)

Fig.17 Monthly mean SSTs in the western North Pacific (top) and anomalies (bottom) for DEC 1994. Anomalies are computed with respect to the JMA climatology (1961–90). The contour interval is 1°C and additional anomaly contours of 0.5°C are shown. Negative anomalies are stippled.



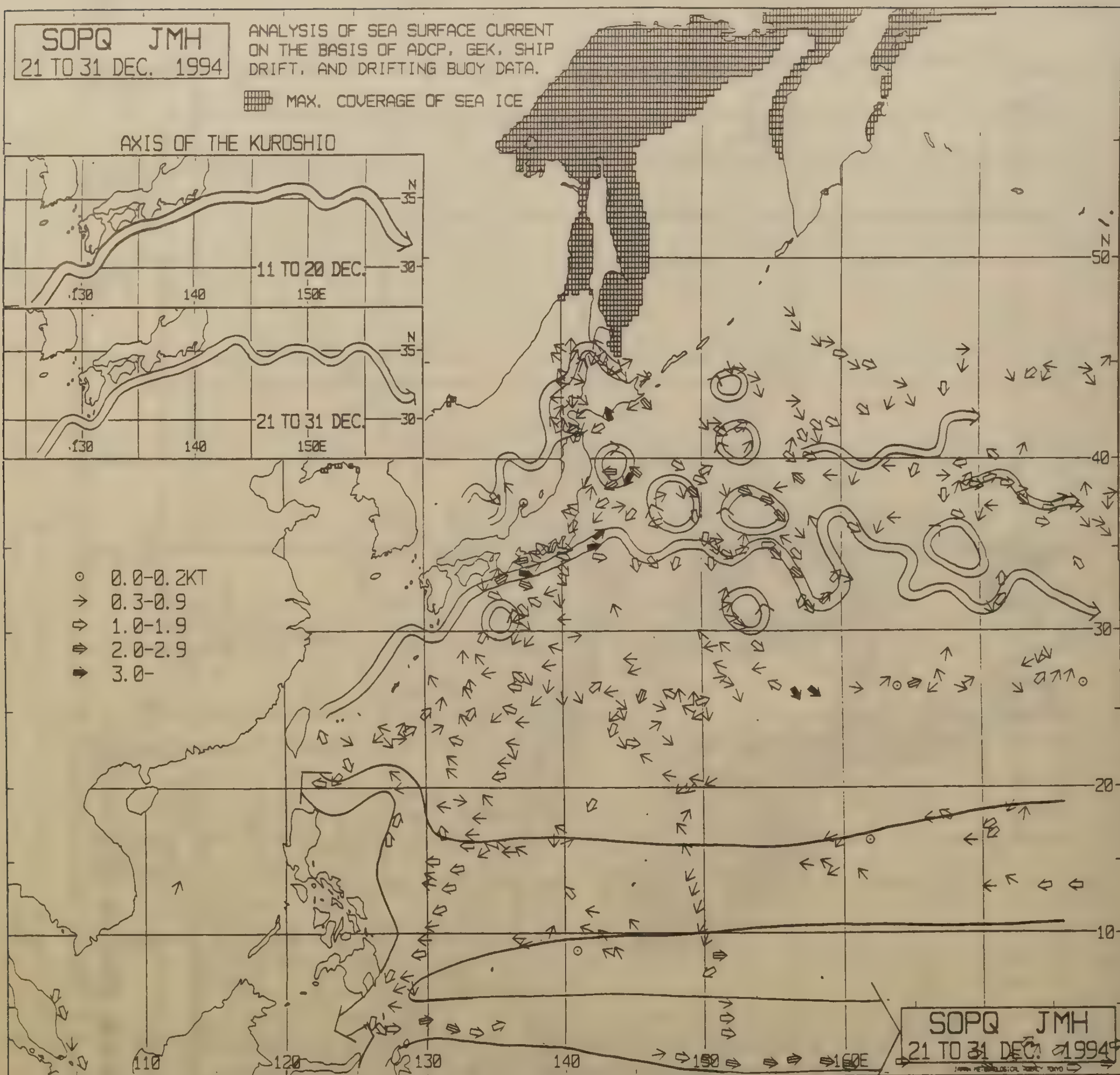
第18図　北西太平洋旬平均海面水温平年偏差時系列図

Fig.18 Time series of the ten-day mean sea surface temperature anomalies (° C) in the western North Pacific for the areas indicated at the bottom. Negative anomalies are shaded. Anomalies are computed with respect to the JMA climatology (1961–90).



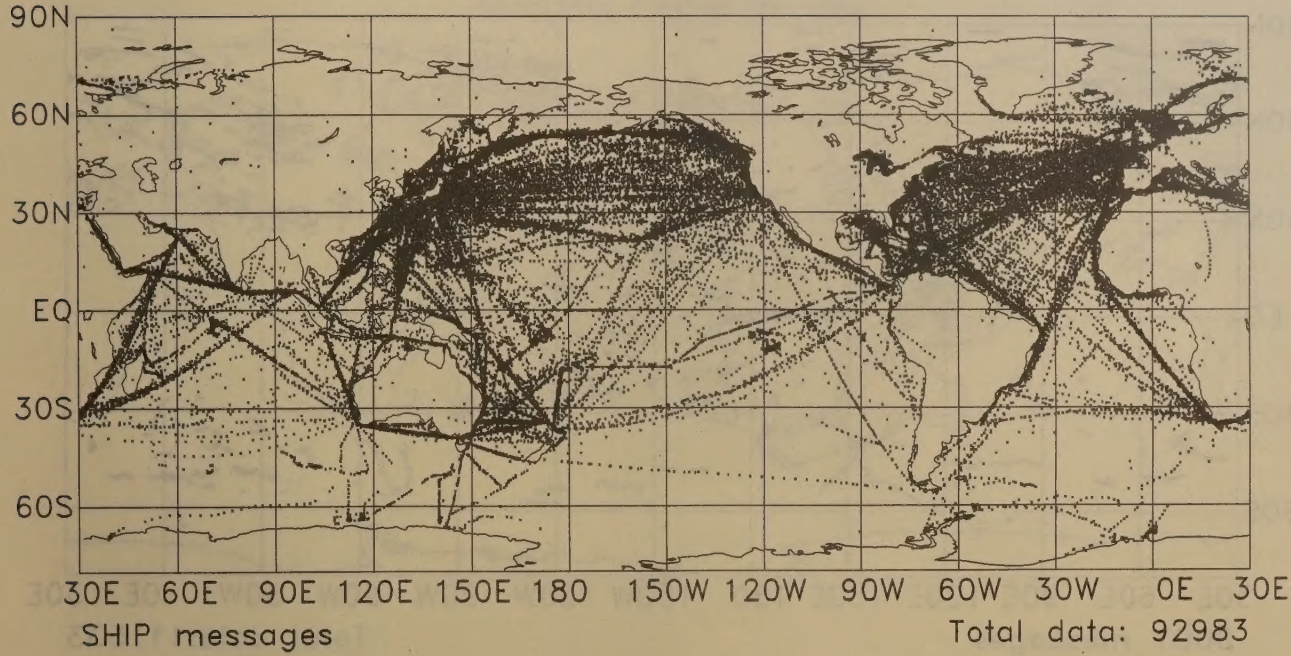
第19図 日本近海表層水温（深さ100M）図（1994年12月）

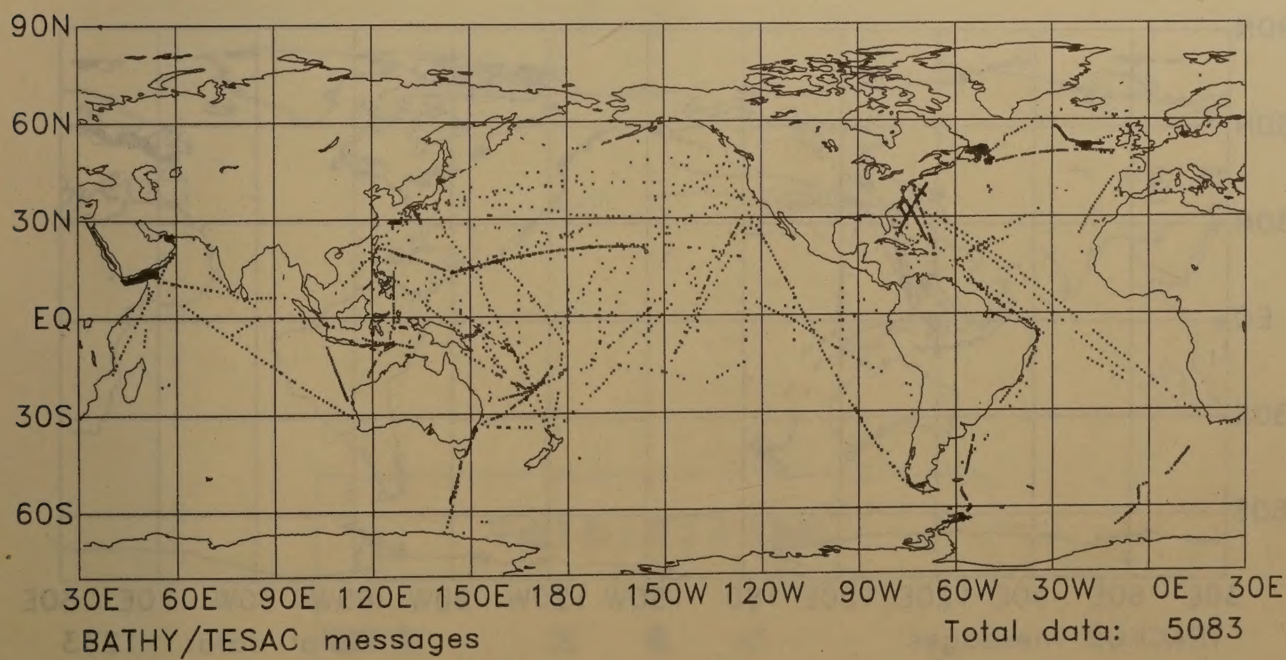
Fig.19 Subsurface (100m) temperatures in seas adjacent to Japan for DEC 1994.



第20図　北西太平洋旬平均海流図（1994年12月下旬）

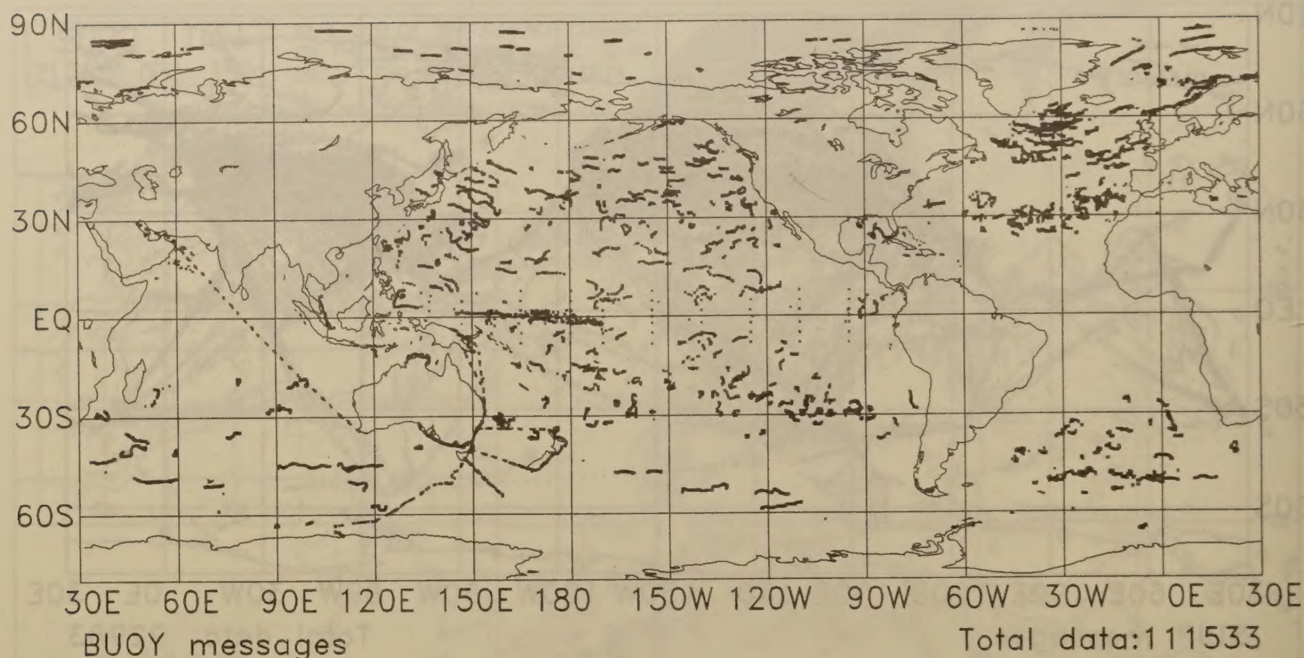
Fig.20 Ten-day analysis of the sea surface current in the western North Pacific for the 3rd ten-day period in DEC 1994. Small arrows indicate sea surface currents measured with acoustic Doppler current profilers, GEKs deployed in research vessels, and ship drift by merchant ships/drifting buoys during the month. Major currents such as the Kuroshio and the North Equatorial Current are denoted by larger open arrows.

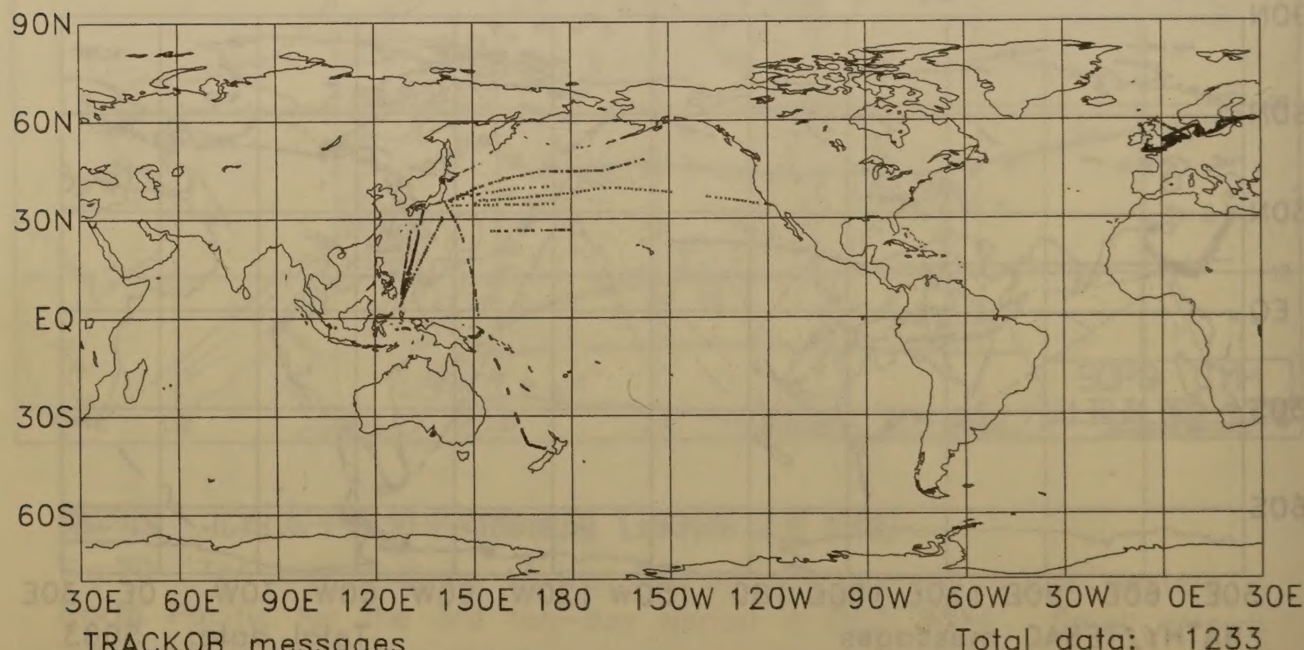




第21-1図　測点分布図(1994年12月)

Fig.21−1　Geographical distribution of SHIP messages (SST data, top) and BATHY/TESAC messages (subsurface temperature data, bottom) for DEC 1994.





第21-2図 測点分布図(1994年12月)

Fig.21-2 Geographical distribution of BUOY messages (buoy drift and SST data, top) and TRACKOB messages (ship drift and SST data, bottom) for DEC 1994.

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